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मानक

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IS 5932 (1999): Boundary Dimensions for Thrust Ball Bearings with Flat Seats [PGD 13: Bearing]



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Indian Standard

(Reaffirmed 2004)

BOUNDARY DIMENSIONS FOR THRUST BALL BEARINGS WITH FLAT SEATS

1. Scope—Boundary dimensions which affect the interchangeability of single and double direction thrust ball bearings with flat seats. Internal design features are not covered in this standard.

2. Terminology

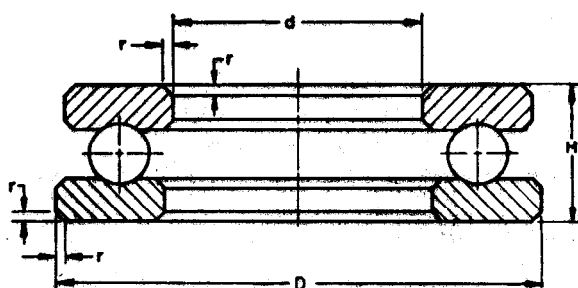
2.1 Diameter Series—Series of bearing outside diameters corresponding to a bearing bore diameter providing several progressive sizes of outside diameter for a given bore diameter and identified by a numeral.

2.2 Height Series—Series of height corresponding to a bearing bore diameter and a bearing outside diameter providing several progressive sizes of height for a given bearing bore and outside diameters and identified by a numeral.

2.3 Dimension Series—A combination of height series and diameter series for a given bearing bore diameter and identified by the numerical figures combining a numeral for height series and a numeral for diameter series in that order.

3. Single Direction Thrust Bearings with Flat Seats

3.1 Notation



d = bore diameter of shaft washer,
 D = outside diameter of housing washer,
 H = bearing height,
 r = chamfer dimension for bore corner of shaft washer
 and outside corner of housing washer, and
 r_{nom} = nominal chamfer dimension*.

3.2 Boundary Dimensions

a) Diameter Series 0

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r</i> _{nom}
		70	90	10	
		Height <i>H</i>			
4	12	4	—	6	0.5
6	16	5	—	7	0.5
8	18	5	—	7	0.5
10	20	5	—	7	0.5
12	22	5	—	7	0.5
15	26	5	—	7	0.5
17	28	5	—	7	0.5
20	32	6	—	8	0.5
25	37	6	—	8	0.5
30	42	6	—	8	0.5
35	47	6	—	8	0.5
40	52	6	—	9	0.5
45	60	7	—	10	0.5
50	65	7	—	10	0.5
55	70	7	—	10	0.5
60	75	7	—	10	0.5
65	80	7	—	10	0.5
70	85	7	—	10	0.5
75	90	7	—	10	0.5
80	95	7	—	10	0.5

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r</i> _{nom}
		70	90	10	
		Height <i>H</i>			
85	100	7	—	10	0.5
90	105	7	—	10	0.5
100	120	9	—	14	1
110	130	9	—	14	1
120	140	9	—	14	1
130	150	9	—	14	1
140	160	9	—	14	1
150	170	9	—	14	1
160	180	9	—	14	1
170	190	9	—	14	1
180	200	9	—	14	1
190	215	11	—	17	1.5
200	225	11	—	17	1.5
220	250	14	—	22	1.5
240	270	14	—	22	1.5
260	290	14	—	22	1.5
280	310	14	—	22	1.5
300	340	18	24	30	1.5
320	360	18	24	30	1.5
340	380	18	24	30	1.5

(Continued)

*Nominal chamfer dimension does not control the shape of the bearing corner, that is, the profile of the bearing corner created by chamfering or rounding-off.

Adopted 15 May 1970

November 1971, BIS

Gr 3

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		70	90	10	
		Height <i>H</i>			
360	400	18	24	30	1.5
380	420	18	24	30	1.5
400	440	18	24	30	1.5
420	460	18	24	30	1.5
440	480	18	24	30	1.5
460	500	18	24	30	1.5
480	520	18	24	30	1.5
500	540	18	24	30	1.5
530	580	23	30	38	2
560	610	23	30	38	2
600	650	23	30	38	2
630	680	23	30	38	2
670	730	27	36	45	2.5
710	780	32	42	53	2.5
750	820	32	42	53	2.5
800	870	32	42	53	2.5
850	920	32	42	53	2.5
900	980	36	48	63	3
950	1 030	36	48	63	3
1 000	1 090	41	54	70	3.5

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		70	90	10	
		Height <i>H</i>			
1 060	1 150	41	54	70	3·5
1 120	1 220	45	60	80	3·5
1 180	1 280	45	60	80	3·5
1 250	1 360	50	67	85	4
1 320	1 440	—	—	95	4
1 400	1 520	—	—	95	4
1 500	1 630	—	—	105	5
1 600	1 730	—	—	105	5
1 700	1 840	—	—	112	5
1 800	1 950	—	—	120	5
1 900	2 060	—	—	130	6
2 000	2 160	—	—	130	6
2 120	2 300	—	—	140	6
2 240	2 430	—	—	150	6
2 360	2 550	—	—	150	6
2 500	2 700	—	—	160	6

b) Diameter Series 1

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		71	91	11	
		Height <i>H</i>			
10	24	6	—	9	0.5
12	26	6	—	9	0.5
15	28	6	—	9	0.5
17	30	6	—	9	0.5
20	35	7	—	10	0.5
25	42	8	—	11	1
30	47	8	—	11	1
35	52	8	—	12	1
40	60	9	—	13	1
45	65	9	—	14	1
50	70	9	—	14	1
55	78	10	—	16	1
60	85	11	—	17	1.5
65	90	11	—	18	1.5
70	95	11	—	18	1.5
75	100	11	—	19	1.5
80	105	11	—	19	1.5
85	110	11	—	19	1.5
90	120	14	—	22	1.5
100	135	16	21	25	1.5
110	145	16	21	25	1.5
120	155	16	21	25	1.5
130	170	18	24	30	1.5
140	180	18	24	31	1.5
150	190	18	24	31	1.5
160	200	18	24	31	1.5
170	215	20	27	34	2
180	225	20	27	34	2
190	240	23	30	37	2
200	250	23	30	37	2
220	270	23	30	37	2
240	300	27	36	45	2.5
260	320	27	36	45	2.5
280	350	32	42	53	2.5
300	380	36	48	62	3
320	400	36	48	63	3
340	420	36	48	64	3
360	440	36	48	65	3
380	460	36	48	65	3
400	480	36	48	65	3

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		71	91	11	
		Height <i>H</i>			
420	500	36	48	65	3
440	540	45	60	80	3·5
460	560	45	60	80	3·5
480	580	45	60	80	3·5
500	600	45	60	80	3·5
530	640	50	67	85	4
560	670	50	67	85	4
600	710	50	67	85	4
630	750	54	73	95	4
670	800	58	78	105	5
710	850	63	85	112	5
750	900	67	90	120	5
800	950	67	90	120	5
850	1 000	67	90	120	5
900	1 060	73	95	130	6
950	1 120	78	103	135	6
1 000	1 180	82	109	140	6
1 060	1 250	85	115	150	6
1 120	1 320	90	122	160	6
1 180	1 400	100	132	175	8
1 250	1 460	—	—	175	8
1 320	1 540	—	—	175	8
1 400	1 630	—	—	180	8
1 500	1 750	—	—	195	8
1 600	1 850	—	—	195	8
1 700	1 970	—	—	212	10
1 800	2 080	—	—	220	10
1 900	2 180	—	—	220	10
2 000	2 300	—	—	236	10
2 120	2 430	—	—	243	10
2 240	2 570	—	—	258	12
2 360	2 700	—	—	265	12
2 500	2 850	—	—	272	12

c) Diameter Series 2

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		72	92	12	
		Height <i>H</i>			
4	16	6	—	8	0.5
6	20	6	—	9	0.5
8	22	6	—	9	0.5
10	26	7	—	11	1
12	28	7	—	11	1
15	32	8	—	12	1
17	35	8	—	12	1
20	40	9	—	14	1
25	47	10	—	15	1
30	52	10	—	16	1
35	62	12	—	18	1.5
40	68	13	—	19	1.5
45	73	13	—	20	1.5
50	78	13	—	22	1.5
55	90	16	21	25	1.5
60	95	16	21	26	1.5
65	100	16	21	27	1.5
70	105	16	21	27	1.5
75	110	16	21	27	1.5
80	115	16	21	28	1.5
85	125	18	24	31	1.5
90	135	20	27	35	2
100	150	23	30	38	2
110	160	23	30	38	2
120	170	23	30	39	2
130	190	27	36	45	2.5
140	200	27	36	46	2.5
150	215	29	39	50	2.5
160	225	29	39	51	2.5
170	240	32	42	55	2.5

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		72	92	12	
		Height <i>H</i>			
180	250	32	42	56	2.5
190	270	36	48	62	3
200	280	36	48	62	3
220	300	36	48	63	3
240	340	45	60	78	3.5
260	360	45	60	79	3.5
280	380	45	60	80	3.5
300	420	54	73	95	4
320	440	54	73	95	4
340	460	54	73	96	4
360	500	63	85	110	5
380	520	63	85	112	5
400	540	63	85	112	5
420	580	73	95	130	6
440	600	73	95	130	6
460	620	73	95	130	6
480	650	78	103	135	6
500	670	78	103	135	6
530	710	82	109	140	6
560	750	85	115	150	6
600	800	90	122	160	6
630	850	100	132	175	8
670	900	103	140	180	8
710	950	109	145	190	8
750	1 000	112	150	195	8
800	1 060	118	155	205	10
850	1 120	122	160	212	10
900	1 180	125	170	220	10
950	1 250	136	180	236	10
1 000	1 320	145	190	250	12
1 060	1 400	155	206	265	12

d) Diameter Series 3

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside D a- meter	Dimension Series			Cham- fer <i>r_{nom}</i>
		73	93	13	
		Height <i>H</i>			
4	20	7	—	11	1
6	24	8	—	12	1
8	26	8	—	12	1
10	30	9	—	14	1
12	32	9	—	14	1
15	37	10	—	15	1
17	40	10	—	16	1
20	47	12	—	18	1.5
25	52	12	—	18	1.5
30	60	14	—	21	1.5
35	68	15	—	24	1.5
40	78	17	22	26	1.5
45	85	18	24	28	1.5
50	95	20	27	31	2
55	105	23	30	35	2
60	110	23	30	35	2
65	115	23	30	36	2
70	125	25	34	40	2
75	135	27	36	44	2.5
80	140	27	36	44	2.5
85	150	29	39	49	2.5
90	155	29	39	50	2.5
100	170	32	42	55	2.5
110	190	36	48	63	3
120	210	41	54	70	3.5
130	225	42	58	75	3.5
140	240	45	60	80	3.5
150	250	45	60	80	3.5
160	270	50	67	87	4
170	280	50	67	87	4

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		73	93	13	
		Height <i>H</i>			
180	300	54	73	95	4
190	320	58	78	105	5
200	340	63	85	110	5
220	360	63	85	112	5
240	380	63	85	112	5
260	420	73	95	130	6
280	440	73	95	130	6
300	480	82	109	140	6
320	500	82	109	140	6
340	540	90	122	160	6
360	560	90	122	160	6
380	600	100	132	175	8
400	620	100	132	175	8
420	650	103	140	180	8
440	680	109	145	190	8
460	710	112	150	195	8
480	730	112	150	195	8
500	750	112	150	195	8
530	800	122	160	212	10
560	850	132	175	224	10
600	900	136	180	236	10
630	950	145	190	250	12
670	1 000	150	200	258	12
710	1 060	160	212	272	12
750	1 120	165	224	290	12
800	1 180	170	230	300	12
850	1 250	180	243	315	15
900	1 320	190	250	335	15
950	1 400	200	272	355	15

e) Diameter Series 4

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		74	94	14	
		eight <i>H</i>			
25	60	16	21	24	1.5
30	70	18	24	28	1.5
35	80	20	27	32	2
40	90	23	30	36	2
45	100	25	34	39	2
50	110	27	36	43	2.5
55	120	29	39	48	2.5
60	130	32	42	51	2.5
65	140	34	45	56	3
70	150	36	48	60	3
75	160	38	51	65	3
80	170	41	54	68	3.5
85	180	42	58	72	3.5
90	190	45	60	77	3.5
100	210	50	67	85	4
110	230	54	73	95	4
120	250	58	78	102	5
130	270	63	85	110	5
140	280	63	85	112	5
150	300	67	90	120	5
160	320	73	95	130	6
170	340	78	103	135	6
180	360	82	109	140	6
190	380	85	115	150	6

(Dimensions in millimetres)

Bore Dia- meter <i>d</i>	Outside Dia- meter <i>D</i>	Dimension Series			Cham- fer <i>r_{nom}</i>
		74	94	14	
		Height <i>H</i>			
200	400	90	122	155	6
220	420	90	122	160	8
240	440	90	122	160	8
260	480	100	132	175	8
280	520	109	145	190	8
300	540	109	145	190	8
320	580	118	155	205	10
340	620	125	170	220	10
360	640	125	170	220	10
380	670	132	175	224	10
400	710	140	185	243	10
420	730	140	185	243	10
440	780	155	206	265	12
460	800	155	206	265	12
480	850	165	224	290	12
500	870	165	224	290	12
530	920	175	236	308	12
560	980	190	250	335	15
600	1 030	195	258	335	15
630	1 090	206	280	365	15
670	1 150	218	290	375	18
710	1 220	230	308	400	18
750	1 280	236	315	412	18
800	1 360	250	335	438	18

f) Diameter Series 5

(Dimensions in millimetres)

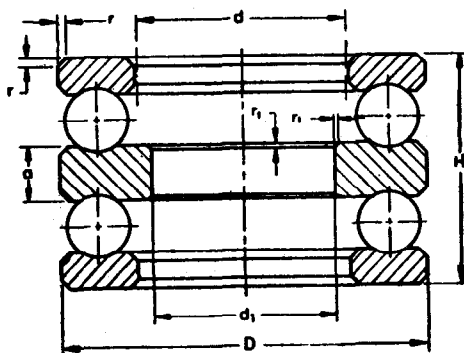
Bore Diameter <i>d</i>	Outside Diameter <i>D</i>	Dimension Series	Chamfer <i>r_{nom}</i>
		95	
		Height <i>H</i>	
17	52	21	1.5
20	60	24	1.5
25	73	29	2
30	85	34	2
35	100	39	2
40	110	42	2.5
45	120	45	3
50	135	51	3
55	150	58	3.5
60	160	60	3.5
65	170	63	3.5
70	180	67	4
75	190	69	4
80	200	73	4
85	215	78	5
90	225	82	5
100	250	90	5
110	270	95	6
120	300	109	6
130	320	115	6
140	340	122	6
150	360	125	8
160	380	132	8
170	400	140	8

(Dimensions in millimetres)

Bore Diameter <i>d</i>	Outside Diameter <i>D</i>	Dimension Series	Chamfer <i>r_{nom}</i>
		95	
		Height <i>H</i>	
180	420	145	8
190	440	150	8
200	460	155	10
220	500	170	10
240	540	180	10
260	580	190	12
280	620	206	12
300	670	224	12
320	710	236	12
340	750	243	15
360	780	250	15
380	820	265	15
400	850	272	15
420	900	290	18
440	950	308	18
460	980	315	18
480	1 000	315	18
500	1 060	335	18
530	1 090	335	18
560	1 150	355	18
600	1 220	375	18
630	1 280	388	18
670	1 320	388	18
710	1 400	412	18

4. Double Direction Thrust Bearings with Flat Seats

4.1 Notation



d = maximum shaft shoulder diameter = bore diameter of shaft washer of corresponding single-direction thrust bearing,

d_1 = bore diameter of centre washer,

D = outside diameter of housing washers = maximum outside diameter of centre washer,

H = bearing height,

a = thickness of centre washer,

r = chamfer dimension (height and width) of outside surface of housing washers,

r_1 = chamfer dimension (height and width) of bore of centre washer, and

r_{nom}, r_{1nom} = nominal chamfer dimensions*.

4.2 Boundary Dimensions

a) Diameter Series 2 — Dimension Series 22

(Dimensions in millimetres)

Maximum Shaft Shoulder Diameter d	Bore Diameter of Centre Washer d_1	Outside Diameter D	Bearing Height H	Thickness of Centre Washer a	Chamfers	
					r_{nom}	r_{1nom}
15	10	32	22	5	1	0.5
20	15	40	26	6	1	0.5
25	20	47	28	7	1	0.5
30	25	52	29	7	1	0.5
35	30	62	34	8	1.5	0.5
40	30	68	36	9	1.5	1
45	35	73	37	9	1.5	1
50	40	78	39	9	1.5	1
55	45	90	45	10	1.5	1
60	50	95	46	10	1.5	1
65	55	100	47	10	1.5	1
70	55	105	47	10	1.5	1.5
75	60	110	47	10	1.5	1.5
80	65	115	48	10	1.5	1
85	70	125	55	12	1.5	1.5
90	75	135	62	14	2	1.5
100	85	150	67	15	2	1.5

*Nominal chamfer dimensions do not control the shape of the bearing corner, that is, the profile of the bearing corner created by the chamfering or rounding-off.

b) Diameter Series 3—Dimension Series 23

(Dimensions in millimetres)

Maximum Shaft Shoulder Diameter d	Bore Diameter of Centre Washer d_1	Outside Diameter D	Bearing Height H	Thickness of Centre Washer a	Chamfers	
					r_{nom}	r_{inom}
25	20	52	34	8	1.5	0.5
30	25	60	38	9	1.5	0.5
35	30	68	44	10	1.5	0.5
40	30	78	49	12	1.5	1
45	35	85	52	12	1.5	1
50	40	95	58	14	2	1
55	45	105	64	15	2	1
60	50	110	64	15	2	1
65	55	115	65	15	2	1
70	55	125	72	16	2	1.5
75	60	135	79	18	2.5	1.5
80	65	140	79	18	2.5	1.5
85	70	150	87	19	2.5	1.5
90	75	155	88	19	2.5	1.5
100	85	170	97	21	2.5	1.5

c) Diameter Series 4—Dimension Series 24

(Dimensions in millimetres)

Maximum Shaft Shoulder Diameter d	Bore Diameter of Centre Washer d_1	Outside Diameter D	Bearing Height H	Thickness of Centre Washer a	Chamfers	
					r_{nom}	r_{inom}
25	15	60	45	11	1.5	1
30	20	70	52	12	1.5	1
35	25	80	59	14	2	1
40	30	90	65	15	2	1
45	35	100	72	17	2	1
50	40	110	78	18	2.5	1
55	45	120	87	20	2.5	1
60	50	130	93	21	2.5	1
65	50	140	101	23	3	1.5
70	55	150	107	24	3	1.5
75	60	160	115	26	3	1.5
80	65	170	120	27	3.5	1.5
85	65	180	128	29	3.5	2
90	70	190	135	30	3.5	2
100	80	210	150	33	4	2

EXPLANATORY NOTE

In order to obviate the difficulty experienced by both the manufacturers and the users of rolling bearings because of the limited scope of IS:2513-1963 'Boundary dimensions for rolling bearings for general engineering purposes'. The Indian Standards Institution undertook to revise the above standard. The boundary dimensions and other aspects like tolerances and internal clearances have been covered in the following Indian Standards:

- IS:5669-1970 General plan of boundary dimensions for radial rolling bearings
- IS:5692-1970 Tolerances for radial rolling bearings
- IS:5932-1970 Boundary dimensions for thrust ball bearings with flat seats
- IS:5933-1970 Tolerances for thrust ball bearings with flat seats
- IS:5934-1970 Chamfers and fillet radii for rolling bearings
- IS:5935-1970 Radial internal clearances in unloaded radial rolling bearings
- IS:6453-1972 Technical supply conditions for rolling bearings

Conforms to ISO Recommendation R 104-1966.